

Application No. 10/716,184
Amendment Dated January 20, 2005
Reply to Office Action dated September 20, 2004

Remarks

Claims 1-11 are pending.

Claims 1-3, 6, 10 and 11 stand rejected.

Claims 4, 5 and 7-9 are objected to.

Claim 1 has been amended.

Claims 1-11 are submitted herein for review.

No new matter has been added.

In paragraph 1 of the Office Action, the Examiner has objected to the specification for not containing the appropriate section headers. Applicants have amended the specification to include the missing section headers, namely “Field of the Invention;” “Background of the Invention;” “Objects and Summary of the Invention;” and “Brief Description of the Drawings.” Applicant notes that the “Related Application” and “Detailed Description” sections were already included in the specification as filed. In view of the above amendments to the specification, Applicant respectfully requests that these objections be withdrawn.

In paragraph 2 of the Office Action, the Examiner has rejected claims 1-11 under 35 U.S.C. § 112 because claim 1, from which claims 2-11 depend, includes the phrase “bringing the ends” (line 3) which lacks antecedent basis. Applicant has amended claim 1, accordingly and respectfully requests that the rejection of this claim be withdrawn.

Turning to the substantive rejections, in paragraph 4, the Examiner has rejected claims 1-3 under 35 U.S.C. § 102(b) as being anticipated by Kato et al. (U.S. Patent No. 6,072,124). In paragraph 5 the Examiner further rejects claims 6, 10 and 11 under 35 U.S.C. § 103(a) as being

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unpatentable over Kato. In paragraph 6, the Examiner acknowledges that claims 4, 5 and 7-9 would be allowable if re-written in independent form and corrected to overcome the technical rejections.

Applicant respectfully disagrees with the Examiner's contentions and submits the following remarks in response.

The present invention as claimed in claim 1 is directed to a method for conductively connecting first and second electrical conductors. The method includes bringing ends of the first and second conductors into mechanical contact with each other in an overlapping position. The first and second conductors are composed of different materials. The first and second conductors are connected to each other by welding without feeding of additional welding material. Finally, the overlapping area is mechanically formed to achieve a smooth width transition between the first and second conductors.

In this arrangement a method is provided for creating a smooth transition in a splice between two conductors where the two conductors are made of different material.

As noted in paragraphs 2 and 3 of page 1 of the specification, prior art attempts have used traditional soldering. However, this method of connecting conductors of different materials results in carbon inclusions in the splicing area, reducing the electrical conductivity through the splice. Prior art attempts have also used crimp connectors to make the splice between connectors. However, this method employs an additional element, making splicing expensive. Also, the crimp connectors at the splice make the extrusion process difficult because of the bulk at the connection point.

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The present invention overcomes these drawbacks by placing the conductors, made of different material, in an overlapping arrangement shown in Fig. 2a. Once overlapped, the two ends are welded by a process that *does not* use additional material as shown in Figs. 2b and 2c. Finally, after welding, the splice area is mechanically formed so as to provide a smooth width transition through the splice area, as shown in Figs. 2d and 2e.

The Examiner contends that the Kato reference teaches all of the elements of independent claim 1. The Kato reference teaches a waterproof covered wire connection. The teachings in Kato is used to connect two wires that are of the same material. For example, as shown in Kato, column 11, lines 29-34 states:

“In the first embodiment, the two covered wires W1 and W2 each of which comprises a conductive wire portion 1 and a cover portion 3 which is formed of resin and coated around the outer periphery of the conductive wire portion, are conductively connected to each other at connection portions S thereof as shown in FIG. 1.” (See also Fig. 9A which shows a single conductor to represent both wires W1 and W2)

The Kato reference goes on to teach a resin chip welding method whereby a resin welding chip is placed between the two conductors to be connected. This process is detailed in column 12, line 28 through column 13, line 35. It is clear from the description in Figs. 3A-4B that additional resin material is used and then left in place in the area of the splice. For example, column 13, lines 25-35 of Kato states:

“After the melting of the resin chips 53 and 55, the pressing and exciting operation of the horn 57 is stopped to harden the melted cover portions 3 and the melted resin chips 53 and 55, and the connection work is finished.

Next, the covered wire connection structure of the first embodiment which is obtained by the connection method as described above will be described. FIGS. 4A and 4B are perspective views showing the covered wire connection structure

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of the first embodiment, where FIG. 4A shows the outline of the connection structure, and FIG. 4B shows the internal structure of the connection structure.”

This structure and method of welding is in stark contrast to the present invention, which 1) connects conductors of different materials; 2) does not employ additional material for the weld and 3) is mechanically formed after the weld to form a smooth transition between the conductors.

As such, the cited Kato reference does not teach or suggest all of the elements of the present invention as claimed in independent claim 1. For example, there is no teaching or suggestion in Kato that discloses the first and second conductors being composed of *different materials*. On the contrary, Kato only shows the connection of connectors made of the same material.

Additionally, there is no teaching or suggestion in Kato that shows connecting the first and second conductors to each other by welding *without feeding of additional welding material*. Kato clearly uses an additional resin chip to make the weld.

Furthermore, there is no teaching or suggestion in Kato that shows *mechanical forming the overlapping area to achieve a smooth width transition* between the first and second conductors. The use of the resin chips in Kato cause a build up of excess material and the connection point between conductors as seen clearly in Figs. 4A and 4B.

As such, Applicant respectfully requests that the rejection of independent claim 1 be withdrawn. Also, as claims 2-11 depend from independent claim 1, these claims should be allowed for the same reasons.

In view of the forgoing, Applicant respectfully submits that pending claims 1-11 are in

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condition for allowance, the earliest possible notice of which is earnestly solicited. If the Examiner feels that an interview would facilitate the prosecution of this Application they are invited to contact the undersigned at the number listed below.

Respectfully submitted,

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